

DRAFT, Version 1.1

Draft Management Recommendations for
Hairy leaf-tip soft-teeth moss
Iwatsukiella leucotricha (Mitt.) Buck and Crum

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EXECUTIVE SUMMARY

Species: *Iwatsukiella leucotricha* (Mitt.) Buck and Crum

Taxonomic Group: Bryophyte: Moss

ROD Components: 1,3

Other Management Status: The Oregon Natural Heritage Program considers *Iwatsukiella leucotricha* to be threatened with extirpation within the state of Oregon (List 2, 1995). The Bureau of Land Management includes this taxon on the Bureau Assessment list for Oregon.

Range: The population of *Iwatsukiella leucotricha* on Saddle Mountain in Clatsop county is the only known site in the conterminous United States. Although not presently known from federal land, it may occur on other fog-drenched peaks in the Olympic Mountains (Olympic National Park, Olympic National Forest) or the Coast Range such as Mt. Hebo, Marys Peak, Onion Peak (Siuslaw National Forest) or Salem District BLM.

Specific Habitat: The only known habitat in the region is on the boles of silver fir on fog-drenched ridges between the peaks of Saddle Mountain, in Saddle Mountain State Park.

Threats: The primary threats to this species at the known site are recreational impacts, overcollecting by scientists, and air pollution. Although the sensitivity of this taxon to air pollution is unknown, bryophytes in general are vulnerable on fog-drenched ridges because aerosols concentrate pollutants.

Management Recommendations:

As the species is known only from Oregon State Parks land, efforts to locate new populations on federal land, if successful, will enhance the chances of continued viability of this species. If *Iwatsukiella leucotricha* is found on federal land, the following recommendations should be applied:

- C Maintain windfirm trees along fog-drenched ridges to maintain biological and structural diversity at known sites. Maintain substrate (e.g., silver fir boles) on which it lives.
- C Maintain microsite conditions including humidity, moisture, and shade.
- C No collecting for scientific purposes or for special forest products should be allowed at the known sites. Allow only sufficient collection, at new sites, to provide voucher specimen to be deposited at a recognized regional herbarium.

Information Needs:

- C Survey potential habitat in Coast Range for *Iwatsukiella leucotricha*. In Washington, possible habitat in federal ownership includes the Olympic Peninsula and fog-drenched

ridges in high precipitation areas of the North Cascades (e.g. Mt. Pilchuck). In Oregon, peaks such as Mt. Hebo or Marys Peak in the Siuslaw National Forest and Salem District BLM should be surveyed.

I. Natural History

A. Taxonomic/Nomenclatural History

Iwatsukiella leucotricha (Mitt.) Buck and Crum was originally described as *Heterocladium leucotrichum* Mitt. in 1891. It has also been known as *Habrodon piliferus* Card. and *Habrodon leucotrichus* (Mitt.) Perss. and was transferred to the genus *Iwatsukiella* in 1978.

It is placed in the order Hypnales, family Ptergynandraceae.

Synonymy:

Heterocladium leucotrichum Mitton in Trans. Linn. Soc. London Bot. Ser. 2,3:176 1891

Habrodon piliferus Card in Bull. Soc. Bot. Geneve ser. 2,3:280 1911

Heterocladium pilicuspis Broth. ex Ihs. in Cat. Moss. Japan:185 1929

Habrodon leucotrichus (Mitt.) Perss in Svensk. Bot. Tidskr. 40:319 1946

Iwatsukiella leucotricha (Mitt.) Buck & Crum in J. Hattori Bot. Lab. 44:352 1978

B. Species Description

1. Morphology (Buck and Crum 1978, Noguchi 1991, Christy and Wagner 1996)

Iwatsukiella leucotricha is a creeping moss which is silky and finely threadlike, and forms loose, whitish green mats. The stems are freely and irregularly branched, whitish-green to golden brown when dry, 0.5 mm wide and up to 3 cm long. Leaf blades are rounded and appressed when dry, with long spreading or recurved awns, resembling cobwebs on the shoots. Leaf cells are oblong or rhombic, thick-walled and smooth, costa absent. Capsules are rare, erect and symmetric with a double peristome.

Claopodium is the only other creeping moss on tree bark that has awns (Chrisy and Wagner 1996). *Iwatsukiella leucotricha* is smaller, lacks papillose cells, and lacks leaf costa.

Figure 1. Line drawings of *Iwatsukiella leucotricha* from Noguchi (part 4:821) (to be added).
(AWAITING COPYRIGHT PERMISSION)

2. Reproductive Biology

In North America, sporophytes were found only once on Chisik Island, near the mouth of Prince Williams Sound, otherwise it is vegetative. Sporophytes are not common in Japan (Schofield, pers. comm.).

3. Ecology

Little is known of the ecology of *Iwatsukiella leucotricha* in North America. It appears to be restricted to the silver fir zone on fog-drenched mountains near the ocean. In general, bryophyte growth is very sensitive to environmental conditions, due to lack of storage organs or specialized tissues to mediate nutrient and water uptake and loss (Norris, pers. comm.). Most species of bryophytes have highly specialized habitat requirements and are often very substrate, microclimate, and microhabitat specific.

C. Range, Known Sites

The population of *Iwatsukiella leucotricha* on Saddle Mountain (Clatsop county) is the only one known in the conterminous United States. It occurs in the Ural Mountains of Siberia, the Russian Far East, Japan, and sporadically along the coast of British Columbia and Alaska. The Saddle Mountain population may be a relict of a formerly more widespread distribution in the Pacific Northwest. Although not known presently on federal land, it may occur on other fog-drenched peaks in the Olympic Mountains or the Coast Range such as Mt. Hebo, Marys Peak, or Onion Peak (Siuslaw National Forest or Salem District BLM).

Figure 2. Known sites of *Iwatsukiella leucotricha* (to be added).

D. Habitat Characteristics and Species Abundance

The known habitat of *Iwatsukiella leucotricha* is fog-drenched ridgetops on silver fir boles between the peaks of Saddle Mountain, in Saddle Mountain State Park. This site was visited in August of 1995, when *Iwatsukiella leucotricha* was found to be fairly abundant, but had been impacted by scientific collection. In Japan, it occurs in subalpine habitat (Schofield, pers. comm.) and is epiphytic on tree boles and branches and on shrubs. In British Columbia and Alaska, it is predominantly epiphytic, but occurs frequently near sea level on shore pine (*Pinus contorta*), Alaska yellow cedar (*Chamaecyparis*), and alder (*Alnus*). It has been reported from cliffs in northern Alaska.

II. Current Species Situation

A. Why Species is Listed under Survey and Manage Standards and Guidelines

Insufficient information was available to rate *Iwatsukiella leucotricha* during the bryophyte viability panel of the Forest Ecosystem Management Analysis Team assessment. Because of its extreme rarity in the Pacific Northwest, this species was included as a strategy 1 and 3 species in the Record of Decision (USDA and USDI 1994). The basis for its inclusion was to maintain viability of the species and conduct inventories to learn more about the actual extent of its range, abundance, and associations.

B. Major Habitat and Viability Considerations

Old-growth silver fir habitat in the Coast Range is limited and the availability of suitable habitat may be a major factor limiting *Iwatsukiella leucotricha*.

C. Threats to the Species

The primary threats to this species at this time are recreational impacts, overcollecting by scientists, and air pollution. All of known collections are from the same population in a small area, on a limited substrate. Trail construction and activities associated with recreation could pose a threat to the species. If additional populations were located, any site disturbing activity could be detrimental.

D. Distribution Relative to Land Allocations

No populations are currently known from federal land. The only known site is located on land administered by Oregon State Parks.

III. Management Goals and Objectives

A. Management Goals for the Taxon

The goal for the management of *Iwatsukiella leucotricha* is to assist in maintaining viability of the species.

B. Specific Objectives

- C Survey potential suitable habitat to locate additional populations.
- C Maintain suitable habitat conditions for all sites discovered on federal land.

IV. Habitat Management

A. Lessons from History

There is a considerable literature on the declines of bryophytes in Europe. Rapid decreases and fragmentation of primeval forests have caused a serious threat to bryophytes (Laaka 1992). In addition, air pollution (particularly sulphur compounds in combination with low pH) and acid rain are implicated in declines of bryophytes (Hallingbäck 1992, Rao 1982). The extinction rate and rates of decline are high in areas where trends are documented (Greven 1992, Hallingbäck 1992). Factors associated with logging that cause declines in bryophytes include the temperature extremes and the drying effect of increased wind, the lowering of surface water, and drying of logs, reduction in amount of coarse woody debris substrate, increased dispersal distance between fragments of primeval forest (Laaka 1992).

B. Identification of Habitat Areas for Management

No known sites have been documented on federal land. Until populations are located on federal land, it is not possible to identify specific habitat areas for management. Any known site that is located or discovered will be considered a habitat area for management. Areas with the highest

probability of providing suitable habitat for *Iwatsukiella leucotricha* include the fog-drenched ridges and coastal peaks in high precipitation areas on the Siuslaw National Forest and Salem District BLM within the coast range, (e.g., Mt. Hebo, Mary's Peak, Onion Peak) and the Olympic Mountains.

C. Management within Habitat Areas

As this species is only known from land administered by Oregon State Parks, efforts to locate new populations on federal land, if successful, will enhance the chances of continued viability of this species. If *Iwatsukiella leucotricha* is found on federal land, the following recommendations should be applied:

- C Maintain windfirm trees along fog-drenched ridges to maintain biological and structural diversity at known sites. Maintain substrate (e.g., silver fir boles) on which it lives.
- C Maintain microsite conditions including humidity, moisture, and shade.
- C No collecting for scientific purposes or for special forest products should be allowed at the known sites. Allow only sufficient collection, at new sites, to provide voucher specimen to be deposited at a recognized regional herbarium.

D. Other Management Issues and Considerations

Air quality may eventually be a consideration for the peaks in the Coast Range that may be inhabited by *Iwatsukiella leucotricha*.

V. Research, Inventory and Monitoring Needs

A. Data Gaps and Information Need

Potential habitat on ridgetops in Coast Range should be surveyed for this species. In Washington, possible habitat in federal ownership includes the Olympic Peninsula and fog-drenched ridges in high precipitation areas of the North Cascades (e.g. Mt. Pilchuck). In Oregon, peaks such as Mt. Hebo or Marys Peak in the Siuslaw National Forest should be surveyed. Further comparison of the habitat at Saddle Mountain to that in other parts of the range of *Iwatsukiella leucotricha* may be valuable in determining ecological requirements and in identifying additional suitable habitat.

B. Research Questions

- C What are the habitat requirements of *Iwatsukiella leucotricha*?
- C How does it reproduce and disperse?
- C How do the disjunct populations of *Iwatsukiella leucotricha* differ genetically and ecologically from those in Japan and Russia?

C. Monitoring Needs and Recommendations

If populations are located on federal land, sites should be monitored to insure compliance with management recommendations based on a regionally developed protocol.

VI. References

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